UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,634	11/20/2003	Jun Someya	1190-0584P	6332

			EXAMINER
2292	7590	09/17/2004	WU, XIAO MIN

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ART UNIT	PAPER NUMBER
2674	

DATE MAILED: 09/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.	Applicant(s)
		10/716,634	SOMEYA ET AL.
Office Action Summary		Examiner	Art Unit
		XIAO M. WU	2674

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 9-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 November 2003 and 30 March 2004* is/are: a)☒ accepted or b)☐ objected to by the
Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☒ Certified copies of the priority documents have been received in Application No. <u>09/883,940</u>.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *11/20/2003*.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims 1-7 and 9-20 are rejected under 35 U.S.C. 102(b) as being anticipated by

Wakisawa et al. (US Patent No. 6,002,810).

As to claims 1, 9-15, 18, Wakisawa discloses a method of processing an input image to

obtain an output image, the input image being formed from input pixels having brightness levels,

the method comprising the steps of: detecting pixel-to-pixel variation in the brightness levels in

at least one direction in the input image (2102, 2103, Fig. 21), thereby generating high spatial

frequency information (col. 13, lines 36-57) and a variable zoom ratio(see Fig. 6); setting

interpolation points with spacing varying according to the high spatial frequency information

(e.g. using straight line interpolation f1 or curve line interpolation, see 14B and 22C) and the

variable zoom ratio (Fig. 6); and generating output pixels from the input pixels by interpolation

at the interpolation points (see Fig. 14A).

As to claims 2, 15, 19, Wakisawa discloses assigns a basic value to the spacing in parts of

the image in which brightness level of the input pixels is uniform (e.g. 226, 228 and 230, Fig.

22C), divides each portion of the image in which the brightness levels of the input pixels vary

into a first part (227, Fig. 22C) and a second part (229, Fig. 22C), reduces the spacing to less

than the basic value in the first part, and increases the spacing to more than the basic value in the second part.

As to claims 3, 16, 20, Wakisawa discloses that assigns a basic value to the spacing in parts of the image in which the brightness level of the input pixels is uniform, divides each portion of the image in which the brightness levels of the input pixels vary into a first part, a second part, and a third part, reduces the spacing to less than the basic value in the first part and the third part, and increase the spacing to more than the basic value in the second part (see Figs. 32).

As to claims 4-6, Wakisawa discloses calculating a derivative of the brightness levels in one direction (col. 13, lines 32-36).

As to claim 7, Wakisawa discloses determining spatial frequency component of the image (col. 13, line 40 to col. 14, line 20).

Response to Arguments

3.   Applicant's arguments filed 11/20/2003 have been fully considered but they are not persuasive.

Applicant argues that Wakisawa fails to disclose the features recited in claims such as detecting pixel-to-pixel variations in the brightness levels in at least one direction in the input image, thereby generating high spatial frequency information, and setting interpolation points with spacing varying according to the high spatial frequency information. Applicant's arguments are not persuasive. Wakisawa discloses that in an area in a image including more

high frequency components, where light and shade of the image is clearly visible, attention is

paid to the fact **that an absolute values d for a difference between values (for example,, gray**

scale levels) of two pixels data sets is greater than a predetermined value. In a case where

the absolute value of being the difference between image data of two pixels is less than the

predetermined value, as in a case of an area in an image including more low frequency

components, where light and shade of the image is not particularly discernible, a set of values for

interpolation pixels are generated, which are positioned on the first interpolation equation (for

example, a linear equation passing through values of pixels data for two pixels) which does not

maintain, that is, which eliminates, the high frequency components of the image. On the other

hand, in an area in an image including more high frequency components, where light and shade

of the image is clearly visible, when an absolute value d of the difference between two pixel

values is greater than a predetermined value, a set of values for interpolation pixels are

generated, which are positioned on the second interpolation (for example, a curve equation of a

spline function passing through values of pixels data for two pixels) which maintains the high

frequency components of the image, by comparing with the first interpolation equation. In other

words, a curve interpolation for the two adjacent pixels are applied when the pixels are in an high

frequency component area, and a linear interpolation for the two adjacent pixels are applied

when the pixels are in an low frequency component area. Thus, Wakisawa clearly discloses the

limitation of "detecting pixel-to-pixel variations in the brightness levels in at least one direction

in the input image, thereby generating high spatial frequency information, and setting

interpolation points with spacing varying according to the high spatial frequency information" as

argued by applicant.

Applicant further argues that Wakisawa's zoom ratio is fixed and predetermined. This argument is not persuasive because Wakisawa clearly discloses that the horizontal and vertical magnifications are variable as shown in Figs. 5 and 6.

Conclusion

4.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The US Patent Application Publication 2001/0020950 and 2003/0053708 are cited to teach an image processing device including pixels interpolation.

5.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiao Wu whose telephone number is (703) 305-4721.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shalwala Bipin, can be reached on (703) 305-4938.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377

xw
September 16, 2004

XIAO WU
PRIMARY EXAMINER
ART UNIT 2674